

Bio2actives: after the challenges, the ambition

Organised from 5 to 7 July 2022, in Quimper, the 2nd edition of this congress dedicated to the valorisation of biomasses and organised by Biotech Santé Bretagne plunged research and industry (a hundred industrialists and academic players) into the heart of a crucial issue. Now that everyone agrees on the need for this development, how do we move forward? What actions/technologies should be implemented to this end?

Hugo de Vries (former director of the Wageningen Food Technology Centre in the Netherlands, at INRAE since 2010) set out the challenges of the recovery of agricultural by-products. One figure alone gives you a headache: every year, agricultural processing generates nearly one billion tonnes of waste. Awareness of this waste is not new: 50 years ago, the Club of Rome concluded in a report that unlimited growth in population and material production was not sustainable. The FAO has set up the International Sustainable Bioeconomy Working Group (ISBWG), a platform for sharing knowledge and experience to build strategies for a sustainable and circular bioeconomy, which is already an economic reality.

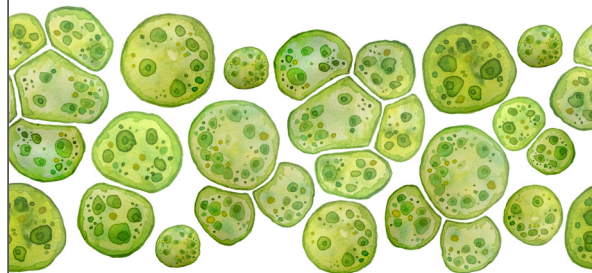
Key questions arise for each field explored. Faced with the biodiversity of resources, how can these biomasses be mobilised? Which transformation processes should be used? Where should they be located? On what scale? Recycling is not without its questions either, particularly with regard to its cost and feasibility. Last but not least, how to organise and anticipate flows.

Answers to these questions can be provided by local players, on a territorial scale: a country but also a region.

Industrialists have a role to play here, as Maud Benoit-Le Gelebart, Green Chemistry Project Manager at Algaia, reminded us when presenting the Spiralg project. Based on the microalga *Spirulina*, involving five partners (Algaia, Greensea, Livegreen Technology, MIAL Microalgae Technology and University College Dublin), the project (May 2018-January 2023) aims to build an algal biorefinery, which will make the most of the different components and intermediates of the *Spirulina* biomass in order to maximise the value derived from the biomass feedstock. Its main objective: to build

NOVEL FOOD REGULATION: NEW CRITERIA TO BE TAKEN INTO ACCOUNT

The European Union's regulations explain that any food that had not been consumed in a significant way in Europe before May 1997, the date on which the first regulation (Reg. 258/97) on novel foods came into force, is considered to be a novel food. Jérôme Le Bloch, from the Nutraveris consultancy in Saint-Brieuc, explains that a large number of ingredients and foods have been authorised since this regulation came into force. For example, insects have received positive opinions from the EFSA, leading to their authorisation in various foodstuffs. Similarly, algal biomasses and/or derived ingredients have also been authorised or are under evaluation. The revision of the Novel Food Regulation published in 2015, and applicable since 1st January 2018 (Regulation 2015/2283), has made it possible to clarify the definition of a novel food, to simplify the procedure (centralisation and electronic submission) and the creation of a procedure for foods from third countries with 25 years of traditional consumption. It should be noted that the dossiers evaluated by EFSA must now contain a thorough identification of the ingredient or its source, via advanced genetic analysis techniques.



a demonstration plant with a planned production capacity of 1 M t/year of phycocyanin and, provisionally, some MT of extracts enriched with free amino acids and carbohydrates. In this spirit, Greensea has already developed a strategic industrial partnership with Livegreen, Algaia and MIAL to ensure the supply of algae and the valorisation of its co-products in order to build a complete value chain. Two potential sectors are targeted: crops and food/animal health.

The Algae4IBD project (21 partners in 21 countries) aims to develop functional foods and drugs for pain, inflammation and IBD using algae compounds. To support this 'venture', the European Commission has set up a funding programme of over €30 million (call FNR-11-2020) under the EU's Horizon 2020 research and innovation programme.

In addition to Algae4IBD, three other research projects are now funded under this programme to research natural compounds for a wide range of fields: medicine, food, agriculture, cosmetics.

«Generating fractions of interest for the food industry from microalgae»: this is how Léa Vernes, a researcher specialising in microalgal technologies at Algama, defines the French Tech's approach. A B2B positioning that involves identifying compounds of interest in spirulina after cell disruption via ultrasound - an eco-process. These compounds include gelling and emulsifying proteins, phospholipids, polysaccharides, pigments, etc. Our egg substitute ingredients combine these different fractions,» explains Léa Vernes. With technological properties adaptable to the applications, Tamalga™ can be found in cooking products, sauces, etc.

From the bench to the industrial stage: Algama's recently successful fundraising of €11.5m will enable the construction of a production site - operational by the end of 2023.

WHAT ABOUT ANIMAL RECYCLING?

«France is the second largest livestock breeding country in Europe,» says Vincenza Ferraro (Inrae), «but is the last in terms of recycling». But beyond this observation, the residues of animal parts that are not meat ('fifth quarter') are significant in Europe: they represent an annual deposit of 17 million tonnes/year. In France, 2 million tonnes of bones are produced annually (68% in the beef sector).

However, these by-products are rich in compounds of interest. The list is long: design of biomaterials (with type I collagen and others); compounds with anti-inflammatory functions (treatment of rheumatoid arthritis, cartilage degeneration) and regulating the absorption of nutrients (satiety, lipid metabolism); growth and tissue repair factors; hormone-equivalents (insulin, prostaglandins); bioactive peptides (antioxidants, anti-diabetics, anti-inflammatories, etc.); mineral matter (in the food industry); and the use of the bone as a raw material in the manufacture of food.); mineral matter (in bone 60%): calcium 40%, phosphorus 20%.

Illustration of the use of marine co-products by Elodie Bouvret, R&D manager of Abyss Ingredients, with hydrolysates tested for their effectiveness in preventing age-related cognitive decline (see this issue). •

Report realized with the collaboration of Delphine Pirot, in charge of studies and monitoring, Biotech Santé Bretagne



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